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Docket Management Facility
U.S. Department of Transportation
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Washington, DC 20590-001

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Regarding Docket Number: **FAA-2004-17005**

Dear Sir or Madam:

I am submitting these comments to voice my opposition to the proposed National Defense Airspace (or "NDA"). As with the exiting ADIZ and FRZ, this proposal does nothing to protect the public or the institutions of government from any credible terror threat, but poses a significant hazard to pilots, members of the flying public and members of the public on the ground. Therefore, I ask that the NDA proposal be abandoned, and that the ADIZ and FRZ be abolished without delay.

Throughout the history of aviation, there has never been a case of a light General Aviation aircraft being used to commit a terrorist attack. Indeed, after more than three years of research, I have been unable to find a single case (documented or not) of a General Aviation aircraft being used successfully in either a murder or a murder/suicide. Given the large number of attempts, it is obvious that light aircraft pose virtually no security threat.

Operational Patterns of Al-Qa'ida in Western Countries

Given that the DHS believes that Al-Qa'ida is the group most likely to use GA, we will begin by looking at Al-Qa'ida's operational patterns in Western countries.

When operating in the U.S., Al-Qa'ida has learned that maintaining operational security requires that they maintain a low profile. This prevents them from obtaining and transporting large quantities of dangerous substances. As a result, Al-Qa'ida has become very adept at using small quantities of weaponry for large effect. For example:

- ✓ The recent London bombings and subsequent attempts used small quantities of explosives that could be easily carried by a bomber into a crowded area.
- ✓ The recent Madrid bombings again used rather small quantities of explosives.
- ✓ The Sept. 11, 2001 attacks were conducted using knives, box cutters and other "hand tools".

As well, there may be supply and financing issues associated with this operational pattern. Furthermore, while much is made of the "sophistication", "coordination" and "complexity" of Al-Qa'ida attacks, in practice, they are generally extremely simple yet elegant engineering solutions to the problem of causing mass casualties and terror. Institutionally, Al-Qa'ida thinks like a skilled engineer.

There are four "terror attack scenarios" that have been applied to aircraft, and attributed to Al-Qa'ida or similar organizations. These include a Nuclear Bomb, a "Dirty" Bomb, a Chemical or Biological Attack and, as was seen on Sept. 11, 2001, an "Impact Attack". To properly understand the level of threat from General Aviation, it is necessary to examine each of these attack scenarios in detail. Below is a summary.

Nuclear Bomb Attack

While it may be possible for Al-Qa'ida or a similar organization to obtain or build a Nuclear Weapon and transport it to the U.S., chances are very good that it would not be an extremely modern or sophisticated example of the type. Without discussing the details of weapon design, the fact is that the bomb will be heavy.

As a point of reference, the selection of the B-29 as the platform from which to deliver the two nuclear weapons used on Japan during World War II was based significantly on the useful load of the B-29. No other bomber could carry the weapon.

Given that, according to the proposal, almost 70% of General Aviation aircraft constitute small aircraft, it is reasonable to assume that the overwhelming number of GA aircraft would be incapable of carrying nuclear weapons. Furthermore, those that can are kept in secure environments, rivaling or exceeding the security used by Part 121 airlines. Finally, these aircraft tend to operate at speeds that render the existing protections worthless, as will be demonstrated later.

Obtaining a large aircraft creates a significant operational security risk for the terrorist organization. The taking of such an aircraft is likely to result in the exposure of the plot, as it is not possible to simply rent one. However, based on the topography of the Washington D.C. downtown area, it would be reasonably simple to bring a nuclear weapon into the city in a truck, and to detonate it at or near the axis of the mall, thus exposing the White House, the Capital, several monuments and thousands of Federal Employees, tourists and other people in the area to a very direct blast. There is no mechanism in place to prevent such an attack.

Dirty Bomb Attack

A dirty bomb (consisting of low-grade radioactive materials wrapped around an explosive core) has several issues associated with it. While the short-term terror value may be great, the effectiveness of such a weapon has been called into question. Furthermore, the amount of radioactive material required is excessive, and would render the weapon too heavy to be carried by the vast majority of General Aviation aircraft.

Chemical / Biological Weapon Attack

When considering Chemical and Biological attacks, it is important to keep two facts in mind. First, airborne delivery of such a weapon is extremely difficult. (As the old saying goes, "the solution to pollution is dilution.") Secondly, in keeping with past operational patterns, the quantity of agent used by the attackers will probably be rather small.

There are two generally accepted ways of delivering Chemical and Biological weapons to the "battlefield". The first, via explosive distribution, is unlikely here do to the large percentage of agent that is destroyed by heat and light during the explosion. The second is aerosol delivery, during which the material is sprayed or otherwise introduced to the air. The delivery of Anthrax via envelope (as was seen shortly after 9/11) is a simple example of this type of delivery.

An Aerosol delivery from an aircraft is extremely difficult. First, it requires an in-depth understanding of the winds at the time of weapon release. As anyone who has walked around downtown Washington D.C. (or any other major city) knows, the winds are very unpredictable around large buildings. Second, to avoid wide dispersal of the agent, the agent must be released in the boundary layer, no higher than 200 to 300 feet above the ground. (http://en.wikipedia.org/wiki/Chemical_weapon#Aerodynamic_dissemination).

To counter these problems on a battlefield, militaries tend to use large amounts of agent in overlapping attacks. Obviously, attempting to do this would be completely counter to Al-Qa'ida's operational pattern.

Additionally, flying an aircraft at 200 to 300 feet, spraying a substance is, at the very least, somewhat suspicious. This would result in the immediate implementation of civil defense procedures, which (we hope) would substantially reduce the number of casualties. While a crop-duster flying at low level down Pennsylvania Avenue might make for good television, it does not make for a good terror attack.

A much simpler solution would be to disperse the weapon at ground level using nothing more than a stolen street cleaner or similar apparatus. This would allow the weapon to be placed very precisely (directed at individuals, even), and would delay the start of decontamination procedures, greatly increasing both the casualty levels and the terror effect.

To my knowledge, there are no protections in place against this kind of attack.

Impact Attack

As we saw on Sept. 11, 2001, an impact attack can be extremely damaging. However, there are some very specific pre-conditions that need to be met to make them effective.

To make a impact attack successful, the impact needs to dissipate a large amount of energy (kinetic, potential, heat and/or explosive, etc.) inside the structure. On 9/11, the two large airliners flying into the World Trade Centers had enough kinetic energy to penetrate the skin of the buildings. The burning of buildings (with the remaining jet fuel as a plentiful accelerant) weakened the structures enough so that the potential energy (due to mass and gravity) of the buildings caused them to collapse. It's important to note that, other than starting the fires, the initial explosions did little to bring the buildings down, although the "terror value" was useful to Al-Qa'ida.

The common notion is that putting a bomb into an airplane will make it a deadly weapon. But, this notion is not supported by facts, especially when coupled with Al-Qa'ida's philosophy of simplicity. To make a bomb work, the fusing would need to be very advanced. (The bomb would need to detonate after impact (not before or during), but before the bomb disintegrates as a result of the impact.) While it's possible to develop such fusing given long-term development of specialized bombs and missiles, I don't think it's extremely likely that such fusing would be used by an organization that works hard to keep things simple.

The more plausible solution is to closely replicate the attacks of 9/11. This would entail an aircraft that carries a lot of kinetic energy (mass times the square of velocity), has a large fuel load (as you've seen, this would be more effective than a bomb), and that carries the fuel in the fuselage of the aircraft (as we saw in Tampa, wings get ripped off on impact) or that have heavy wing mounted engines (as we saw on 9/11, engines can punch a hole in the building that will prevent the wings from being ripped off as completely). A light General Aviation aircraft does not meet any of these pre-conditions.

As a result of these findings, it is obvious that light General Aviation aircraft do not pose a significant threat to the National Security of the United States or it's citizens or infrastructure.

Effectiveness of the Proposal

As has been discussed, for an aircraft to pose a significant threat, it needs to have both mass and velocity. Obviously, the size of any proposed airspace should be determined based on the velocity of aircraft that pose a threat. Another factor to consider is ease with which potential energy due to altitude can be converted into real kinetic energy.

There is no public documentation on the amount of time it takes to identify, target and destroy an offending aircraft. However, it is unreasonable to think that this time would be less than five minutes, given the bureaucratic nature of the decision. Allegedly the purpose of the ADIZ and the proposed airspace is to provide such a buffer. However, to this end both the ADIZ and the proposed airspace are entirely ineffective.

In order to receive permission to penetrate the ADIZ, the aircraft needs to be on a filed flight plan, and in RADAR contact and radio communications with Air Traffic Control. However, there is virtually no positive identification associated with the operation of the

aircraft. Aircraft operating over the top of the Class B airspace can operate at high airspeeds, and with high potential energy due to altitude.

In short, by filing a flight plan using another person's name, a known terrorist can already operate an aircraft up to the boundary of the FRZ in a high-energy configuration, regardless of the existence of the proposed airspace or the ADIZ.

Using a Cessna 750 "Citation X" business jet as an example, maximum operating airspeed is 350 knots indicated airspeed (above 8,000 feet up to FL180 and beyond). At 17,000 feet (the highest normal altitude for operating inside the ADIZ or the proposed airspace), this translates to a true airspeed of 469 Knots on a Standard day. Assuming no wind, this would allow the aircraft to be at the center point of the FRZ (or it' s successor) within two minutes of penetration. This time is much too short to be practical.

Safety Impact of the Proposal

While light GA aircraft do not pose a credible threat to the people or institutions in the National Capital Region, the potential of armed intervention by missile batteries and/or armed aircraft does pose a significant threat. As experience has shown us in Iraq, Afghanistan and other areas, expending munitions over populated areas is extremely hazardous to the members of that population. When we consider that deadly force has almost been used twice since the advent of the ADIZ (in neither case was it against an actual threat), and given a history of events (such as the Cessna 185 that was shot down by U.S. and Peruvian forces under similar circumstances in 2001), it is virtually certain that someone will be killed as a result of this proposal.

Do we really need to kill innocent people enforcing a useless regulation?

Furthermore, even with the ADIZ in place, the airspace around the National Capital Region continues to be extremely busy. The additional operational complexity of the airspace greatly increases the risk of operational error by Air Traffic Controllers. While these errors are usually harmless, they can occasionally result in massive loss of life. According to Murphy's law, that which is unlikely is also inevitable. Is that a risk we can take?

Additionally, paperwork problems have already come very close to causing the death of a pilot. On June 23, 2003 a pilot ran out of gas while waiting for his flight plan to be "found" so he could enter the ADIZ. While fuel management is clearly the responsibility of the pilot, this accident would not have happened if the ADIZ had not been there. We are lucky that the pilot (who was alone in the airplane) was uninjured.

Finally, even with the ADIZ and FRZ in place for several years, the associated airspace has not been redesigned to meet these changes. These changes should include bypassing victor airways around the FRZ and, insofar as possible, the ADIZ, and modifying Instrument Approach Procedures (including the Missed Approach segment) to avoid the FRZ. To date, this has not been completed or, to my knowledge, even started.

Potential Risks from Airlines

While the potential threat from General Aviation aircraft is virtually non-existent, the potential threat from Airliners are well documented. However, we continue to permit Airlines to operate within the Flight Restricted Zone.

Obviously, the airlines have a long record of being victimized by terrorists and other criminals. These attacks have resulted in thousands of deaths over the past decades including, but my no means limited to, the Sept. 11, 2001 attacks. It is generally accepted that the airlines are significantly more secure (in general) since the changes resulting from the Sept. 11, 2001 attacks, and that flights into KDCA are substantially more secure. However, this assumption is based on the following beliefs:

- ✓ Fewer weapons are allowed onboard airliners.
- ✓ Bombs are significantly more likely to be detected.
- ✓ Screeners find more contraband weapons.
- ✓ The terror threat is based entirely in the passenger cabin or cargo hold of the airliner.

The first two assertions are, in my opinion, correct. The second two are patently false.

Since the inception of the TSA, there have been dozens of reported cases of individuals accidentally carrying a weapon through security repeatedly over the course of many months, and never being challenged by the TSA. Is it unreasonable to assume that there have been many hundreds of unreported cases?

Additionally, mechanics are (by necessity) required to carry similar weapons (otherwise known as tools) onto aircraft, airliners are parked on unsecured General Aviation ramps overnight, and literally dozens of other security holes exist. In short, the security barrier around Airline operations is, at best, very permeable.

The belief that the threat comes from "outside the cockpit door" is blatantly wrong. One only needs to use Egypt Air 990 as an example of what can happen when an Airline Pilot decides to act on his own. If the flight had departed National, Dulles or BWI, and the suicidal pilot had been intent on causing harm, there is little we could do today to stop him. Indeed, even if one or more Air Marshall's had been on board, the armored cockpit door would have impeded their access.

In short, as long as airliners are large, fast, and accessible to the public, they will continue to be the most significant terror threat in the skies. And yet they are routinely permitted to operate in the areas that are "too sensitive" for virtually harmless General Aviation aircraft.

Conclusions

Based on the above observations, I submit that the proposal is an ineffective solution to a non-existent problem. Further it creates a significant risk to pilots, passengers, and people on the ground within the National Capital Region, and diverts resources from much greater threats I therefore suggest that it be abandoned, and that the ADIZ and FRZ also be abolished.

If you have any questions, please do not hesitate to contact me at (603) 674-7777.

Sincerely,

Robert J. Montgomery
Commercial Pilot & Flight Instructor

CC: Sen. Judd Gregg
Sen. John Sununu
Rep. Jeb Bradley
Phil Boyer, Aircraft Owners and Pilots Association

P.S. All information contained in these comments comes from public U.S. Government sources or non-government sources. Consequently, it is not sensitive and should be published in full.

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